

# SYSTEM, METHOD, AND APPARATUS FOR ESTIMATING LIQUID DELIVERY

## CROSS REFERENCE TO RELATED APPLICATIONS

**[0001]** This application is a continuation of U.S. patent application Ser. No. 16/241,239, filed Jan. 7, 2019 and entitled System, Method, and Apparatus for Estimating Liquid Delivery, which will be U.S. Pat. No. 11,024,419, issuing Jun. 1, 2021 (Attorney Docket No. Y90), which is a continuation of U.S. patent application Ser. No. 15/467,196, filed Mar. 23, 2017 and entitled System, Method, and Apparatus for Estimating Liquid Delivery, now U.S. Pat. No. 10,220,135, issued Mar. 5, 2019 (Attorney Docket No. U91), which is a continuation of U.S. patent application Ser. No. 13/723,251, filed Dec. 21, 2012 and entitled System, Method, and Apparatus for Estimating Liquid Delivery, now U.S. Pat. No. 9,636,455, issued May 2, 2017 (Attorney Docket No. J81) which is a Non-Provisional which claims priority to and the benefit of the following:

**[0002]** U.S. Provisional Patent Application Ser. No. 61/578,649, filed Dec. 21, 2011 and entitled System, Method, and Apparatus for Infusing Fluid (Attorney Docket No. J02);

**[0003]** U.S. Provisional Patent Application Ser. No. 61/578,658, filed Dec. 21, 2011 and entitled System, Method, and Apparatus for Estimating Liquid Delivery (Attorney Docket No. J04);

**[0004]** U.S. Provisional Patent Application Ser. No. 61/578,674, filed Dec. 21, 2011 and entitled System, Method, and Apparatus for Dispensing Oral Medications (Attorney Docket No. J05);

**[0005]** U.S. Provisional Patent Application Ser. No. 61/651,322, filed May 24, 2012 and entitled System, Method, and Apparatus for Electronic Patient Care (Attorney Docket No. J46); and

**[0006]** U.S. Provisional Patent Application Ser. No. 61/679,117, filed Aug. 3, 2012 and entitled System, Method, and Apparatus for Monitoring, Regulating, or Controlling Fluid Flow (Attorney Docket No. J30), each of which is hereby incorporated herein by reference in its entirety.

**[0007]** U.S. patent application Ser. No. 13/723,251, filed Dec. 21, 2012 and entitled System, Method, and Apparatus for Estimating Liquid Delivery, now U.S. Pat. No. 9,636,455, issued May 2, 2017 (Attorney Docket No. J81) claims priority to, benefit of, and is also a Continuation-In-Part Application of the following:

**[0008]** U.S. patent application Ser. No. 13/333,574, filed Dec. 21, 2011 and entitled System, Method, and Apparatus for Electronic Patient Care, now U.S. Pat. No. 10,453,157, issued Oct. 22, 2019 (Attorney Docket No. 197), and

**[0009]** PCT Application Serial No. PCT/US11/66588, filed Dec. 21, 2011 and entitled System, Method, and Apparatus for Electronic Patient Care, now WO Publication No. WO 2013/095459, published Sep. 12, 2013 (Attorney Docket No. 197WO), both of which are hereby incorporated herein by reference in their entireties.

**[0010]** U.S. patent application Ser. No. 15/467,196, filed Mar. 23, 2017 and entitled System, Method, and Apparatus for Estimating Liquid Delivery, now U.S. Pat. No. 10,220,135, issued Mar. 5, 2019 (Attorney Docket No. U91) may also be related to one or more of the following patent applications filed on even date herewith, all of which are hereby incorporated herein by reference in their entireties:

**[0011]** U.S. patent application Ser. No. 13/723,238, filed Dec. 21, 2012 and entitled System, Method, and Apparatus for Clamping, now U.S. Pat. No. 9,759,369, issued Sep. 12, 2017 (Attorney Docket No. J47);

**[0012]** U.S. patent application Ser. No. 13/723,235, filed Dec. 21, 2012, and entitled System, Method, and Apparatus for Dispensing Oral Medications, now U.S. Pat. No. 9,400,873, issued Jul. 26, 2016 (Attorney Docket No. J74);

**[0013]** PCT Application Serial No. PCT/US12/71131, filed Dec. 21, 2012 and entitled System, Method, and Apparatus for Dispensing Oral Medications, now WO Publication No. WO 2013/096718, published Jun. 27, 2013 (Attorney Docket No. J74WO);

**[0014]** U.S. patent application Ser. No. 13/724,568, filed Dec. 21, 2012 and entitled Syringe Pump, now U.S. Pat. No. 9,295,778, issued Mar. 29, 2016 (Attorney Docket No. J75);

**[0015]** U.S. patent application Ser. No. 13/725,790, filed Dec. 21, 2012 and entitled System, Method, and Apparatus for Infusing Fluid, now U.S. Pat. No. 9,677,555, issued Jun. 13, 2017 (Attorney Docket No. J76);

**[0016]** PCT Application Serial No. PCT/US12/71490, filed Dec. 21, 2012 and entitled System, Method, and Apparatus for Infusing Fluid, now WO Publication WO 2013/096909, published Jun. 27, 2013 (Attorney Docket No. J76WO);

**[0017]** U.S. patent application Ser. No. 13/723,239, filed Dec. 21, 2012 and entitled System, Method, and Apparatus for Electronic Patient Care, now U.S. Pat. No. 10,108,785, issued Oct. 23, 2018 (Attorney Docket No. J77);

**[0018]** U.S. patent application Ser. No. 13/723,242, filed Dec. 21, 2012 and entitled System, Method, and Apparatus for Electronic Patient Care, now U.S. Pat. No. 10,911,515, issued Feb. 2, 2021 (Attorney Docket No. J78);

**[0019]** U.S. patent application Ser. No. 13/723,244, filed Dec. 21, 2012 and entitled System, Method, and Apparatus for Monitoring, Regulating, or Controlling Fluid Flow, now U.S. Pat. No. 9,151,646, issued Oct. 6, 2015 (Attorney Docket No. J79);

**[0020]** PCT Application No. PCT/US12/71142, filed Dec. 21, 2012 and entitled System, Method, and Apparatus for Monitoring, Regulating, or Controlling Fluid Flow now WO Publication WO 2013/096722 published Jun. 27, 2013 (Attorney Docket No. J79WO);

**[0021]** PCT Application No. PCT/US12/71112, filed Dec. 21, 2012 and entitled System, Method, and Apparatus for Estimating Liquid Delivery now WO Publication WO 2013/096713 published Jun. 27, 2013 (Attorney Docket No. J81WO); and

**[0022]** U.S. application Ser. No. 13/723,253, filed Dec. 21, 2012 and entitled System, Method, and Apparatus for Electronic Patient Care, now U.S. Publication No. US 2013-0191513-A1, published Jul. 25, 2013 (Attorney Docket No. J85).

## BACKGROUND

### Relevant Field

**[0023]** The present disclosure relates to pumps. More particularly, the present disclosure relates to a system, method, and apparatus for liquid delivery using a syringe pump.